In days past, water resources management in the Western expanses of the United States was focused, for good or for bad, on the improved utilization of water – on the conservation of water for power, agriculture, industry, and of course, people. The improved utilization of water, or as it was called back then conservation, meant the damming of streams and rivers and the diverting of the most precious resource to locations where the water could be put to its maximum beneficial use, which was typically considered to be irrigation of the nation's rich croplands and cattle ranches and processing of mineral resources. In years past, these were well-accepted conservation practices supported by the federal and local governments, and by the citizenry.

"Water is the true worth of a dry land"
Wallace Stegner

A significant natural phenomenon occurred in the 1930's to further drive and influence national sentiments regarding water – the Great Drought. As drought is apt to do, not only did it impact people, families, businesses, and government with respect to short-term resource management, but it also created a paradigm shift, changing the way individuals and organizations thought about water, land, and the connection between the two. Arguably, the greatest impacts of the Great Drought occurred in Texas, Kansas, Oklahoma, Nebraska, Colorado and New Mexico, which coincidentally lie above the largest discrete aquifer in the world, the Ogallala. In the years that followed the Great Drought, it became public policy in these states that the more irrigation, the better, a decision aided by the invention of the centrifugal pump.

Time and weather have again impacted the collective public view of these practices. Irrigators have long known that groundwater resources are finite. Pumping of the Ogallala has contributed to its rapid decline and increased production costs. Development pressures have increased the competition for potable water supply, in some cases drying up agricultural lands through the transfer of water rights, a process that is generally considered both irreversible and potentially damaging to our sustainability as a culture, our heritage and our quality of life. Dams have also been fingered in numerous cases as having caused or contributed to significant environmental damage of submerged wetlands and downstream waterways and riparian corridors. The U.S. Army Corps of Engineers in fact has ongoing authorization from the U.S. Congress to provide local support to those rivers and streams that have been adversely impacted by Army Corps dams across the country for ecosystem restoration, a program that has been used to support river improvements in Nebraska, Colorado, California, Arizona and numerous other Western states.

Water is still in the center of controversy as populations increase in the West; however the nature of the controversy has decidedly changed as has the notion and in some people's minds the definition of what is meant by the term water conservation. Citizens today view the most precious resource as the lifeblood of not only agriculture and the communities that agriculture supports, but as a type of birthright for growing municipalities, as well as for environmental and recreational purposes. As discussed in legal circles, these are all beneficial uses of water. But are all beneficial uses equal in the eyes of the state water administrators and courts, and should they be equally weighted at times of water scarcity? There are no easy answers, and as history has shown, the answers can change over time.

Clearly no one use or user has the sole license or right to use all the water in a basin. Within the State of Colorado, water use is directly related to when, how and for what purpose the water right was claimed. It is a property right and is directly related to a demonstratable beneficial use. This understanding, defined by the laws of prior appropriation ("first in time, first in right"), is clouded in times of water scarcity, if for no other reason than the demonstration by property owners and water administrators that they can be flexible and cooperative when their neighbors with less senior water rights find themselves in need. In fact, recent changes in state laws and policies that allow for cooperative agreements to be developed and implemented between water users in times of water scarcity have codified some of the flexibility water users need and desire. Although property ownership and the rights of that ownership are maintained, as well they should be, the acceptance and use of cooperative agreements has shown that property owners are willing to share their resources even though they are not required to by law in times of drought.

In addition, the most recent drought has demonstrated the variable nature of water needs and water uses in Colorado. Municipal water use changed in response to the drought. Roughly 50% of municipal use is dedicated to lawn irrigation, and this was reduced by 30 to 50% in some locations. Agricultural businesses, which were the hardest hit by the drought, saw numerous farmers and ranchers choose not to use their water, but instead lease their water to thirsty municipalities, because they did not have sufficient water to produce their crops or feed for their livestock. Recreational rafting businesses found river flows so low that float trips could not be sustained or demand of their services was sharply reduced. Any way that you look at it, the drought impacted, and will continue to impact, the way that Coloradoans look at water, water supply and water use in the future.

Office of the State Engineer, Recognized Beneficial Uses

- Augmentation
- Commercial
- Domestic
- Evaporative
- Export from State
- Federal Reserved
- Fire
- Fisheries
- Geothermal
- Household Use Only
- Industrial
- Irrigation
- Minimal Flow
- Municipal
- Other
- Power Generation
- Recharge
- Recreation
- Snow Making
- Stock
- Storage
- Wildlife

State water planners and managers have reason to improve their understanding of drought and drought impacts on the Colorado water user community, given changing public perceptions, competing uses for water, and the impacts of the current drought. For these reasons the Colorado Water Conservation Board (CWCB) undertook this project. The project was developed to plan, develop and implement an assessment, the Drought & Water Supply Assessment, to engage Colorado water users to:

- Determine how prepared Colorado has been for drought, and
- Identify limitations, and related measures, to better prepare us for future droughts.

The CWCB will utilize this information to reinforce its statewide advocacy focus and role on water issues. Through technical, policy and financial support, the CWCB can aide local water users in planning for and mitigating the affects and impacts of drought. As facilitators of water issues at the state and regional level, the CWCB is also in position to help the water community answer the difficult water rights, water use and water supply questions that will drive future water management and planning in all business sectors and aspects of life.

This report documents the key elements of the Drought & Water Supply Assessment project in two sections, divided into 16 chapters. The first section, which contains eight chapters, presents pertinent background information related to the following topics:

- What is drought and what are its impacts?
- How does a drought impact individual perception of water planning and management?
- How has the state responded to the current drought?
- What are the expected changes in state population and demographics in the coming years?
- What is the legal framework within which drought can be managed?
- What are the existing characteristics of storage in Colorado?
- What tools exist to manage and mitigate drought?
- What structural and non-structural projects may be used to mitigate drought?

The second section of the report presents the planning and implementation tasks performed to develop and administer the assessment, as well as the results of the assessment. The assessment results are grouped into the following categories, presented in individual chapters for ease of reader access:

- Current limitations on water supply
- Current water supply, drought and water conservation planning efforts in place
- Impacts of current drought
- Concerns regarding future water supply
- Structural and non-structural project needs for drought mitigation
- Use of cooperative agreements for drought mitigation and water supply planning
- Potential state policy issues for drought mitigation and water supply planning

A note on the survey scope and applicability

The Drought & Water Supply Assessment was implemented to ascertain the opinions of Colorado's large and small water users that store or divert water for delivery to other water users (e.g., reservoir and ditch companies, state water conservancy districts) and water users that "use" the water directly (e.g., farmers and ranchers, special districts, municipalities, industries). The assessment did not attempt to collect opinions from all Colorado voters, or a subset of representative voters. Therefore, the assessment is invaluable with respect to representing the views and opinions of Colorado's water providers and users (called water users throughout the report).